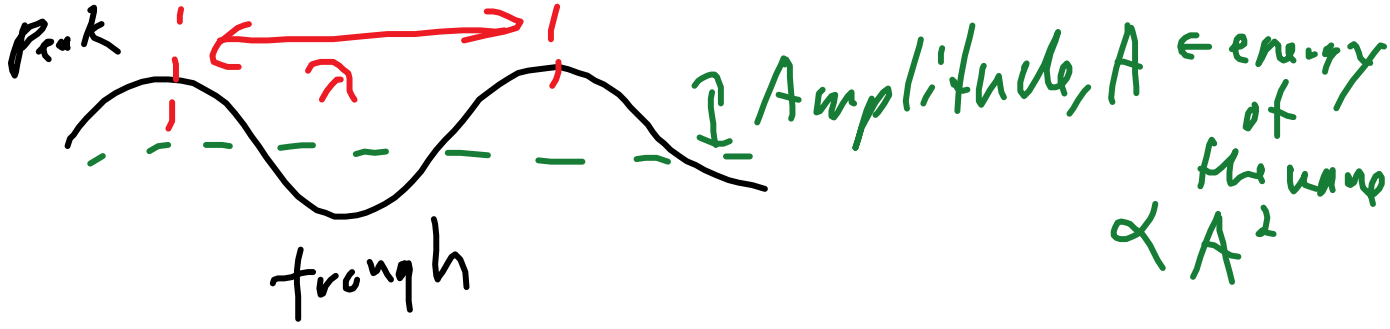
wave applet
http://phet.colorado.edu/sims/wave-on-a-string/wave-on-a-string_en.html

wavelength, λ, is the distance between successive peaks/troughs



frequency, f, is the events/unit time.
units: Hz = event/s

period, T, is the time between waves.
units: s

f=1/T or T=1/f

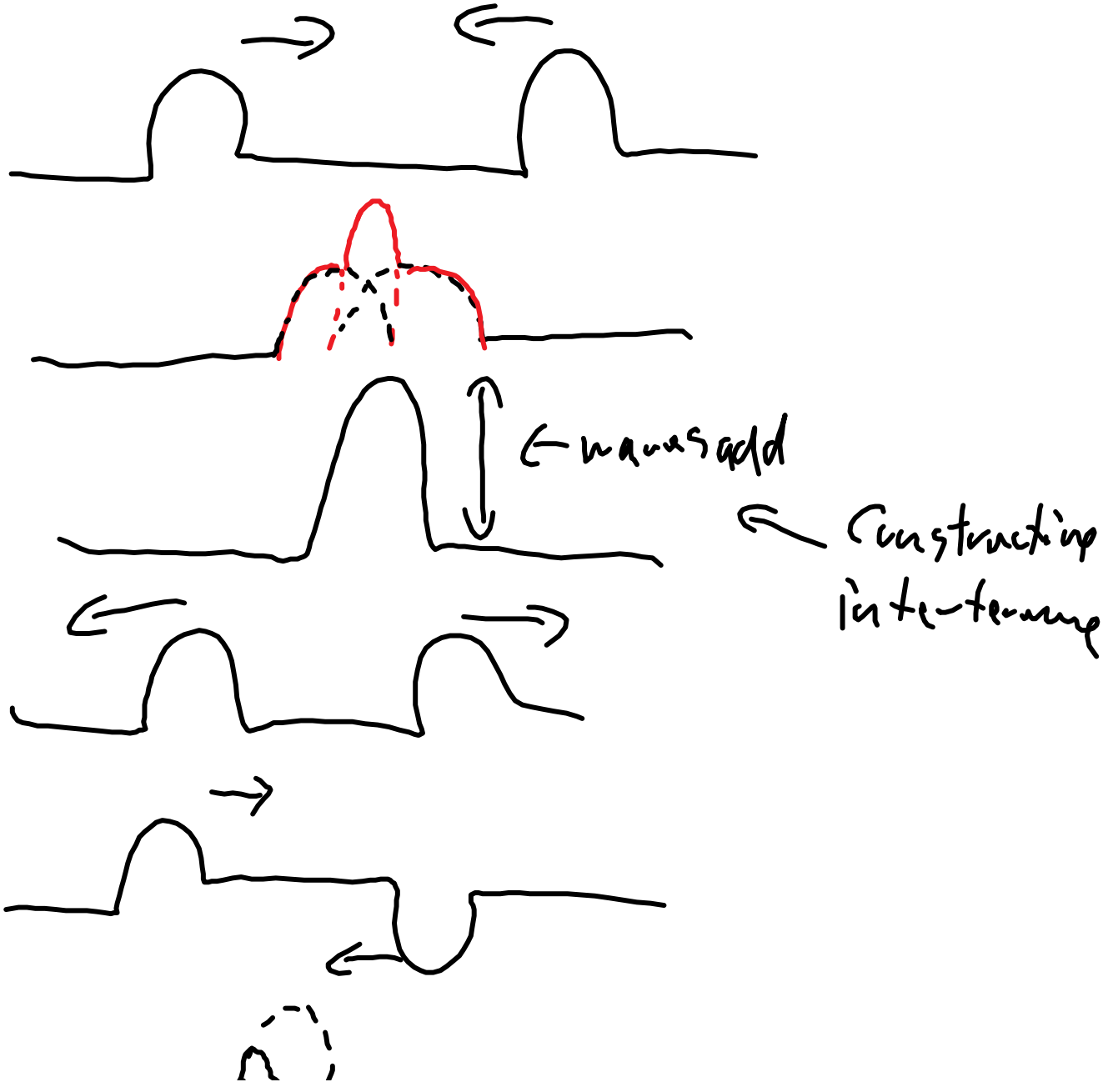
wavespeed, v, is the speed of the energy transfer through the medium.
v = d/t d is the distance travelled per

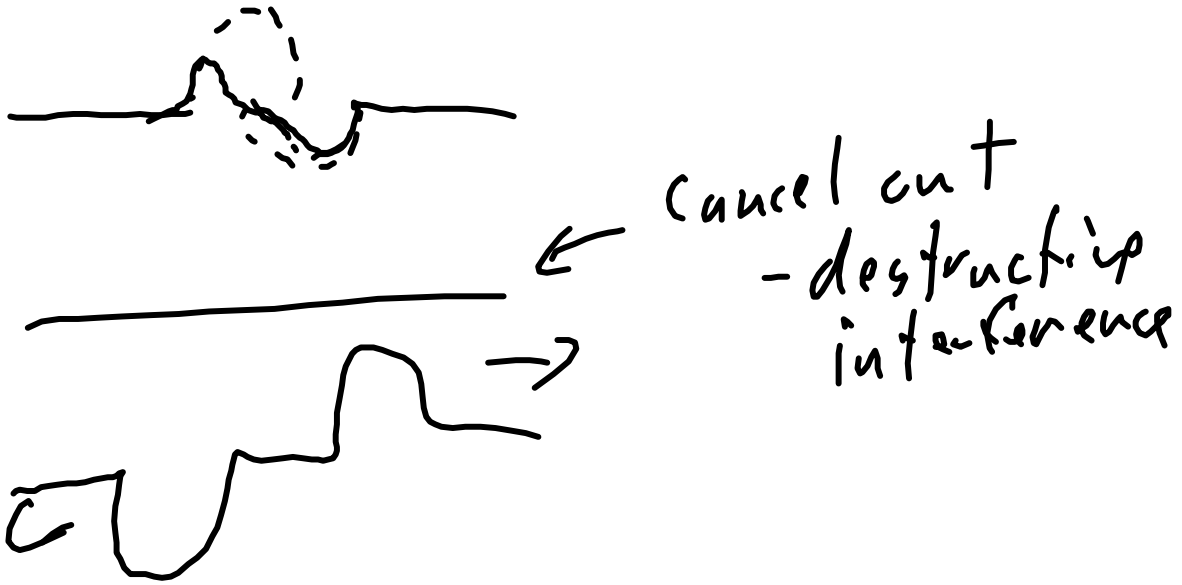
unit time, t

$v = \lambda f$

v depends on medium - tension in the spring for example, or sound goes faster in water than in air.

When waves collide the amplitudes combine





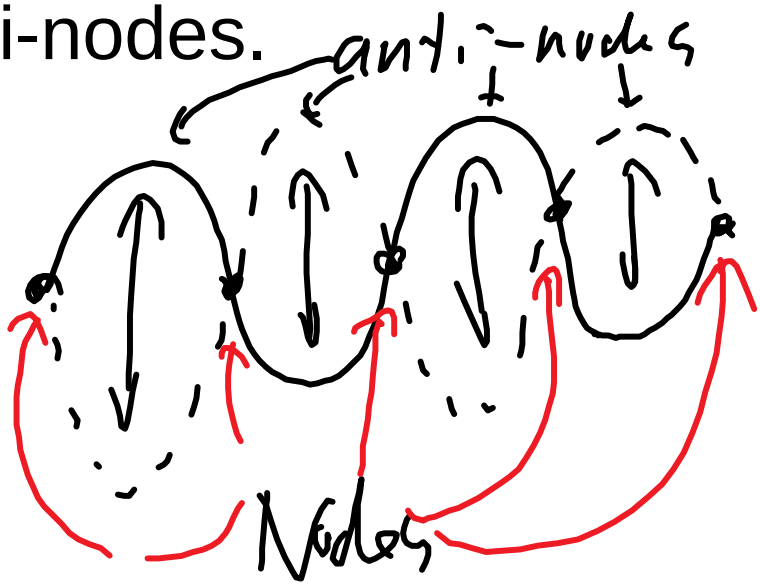
standing waves - if the frequency is just right, incoming waves interfere with reflected waves to create a standing wave, a wave that doesn't appear to move.

http://www.walter-fendt.de/html5/phen/standingwaverefflection_en.htm

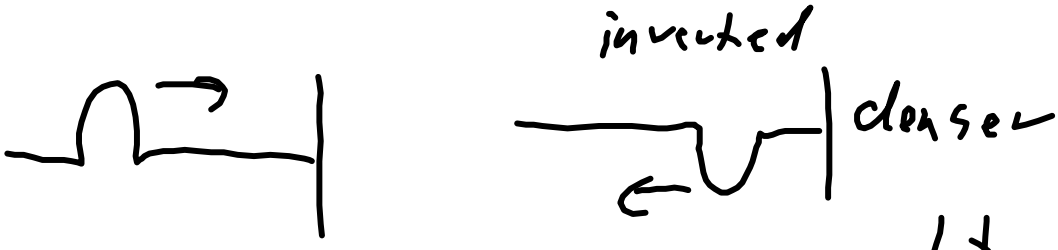
The "just right" frequency that produces standing waves is called the resonant frequency.

standing waves have nodes and anti-nodes

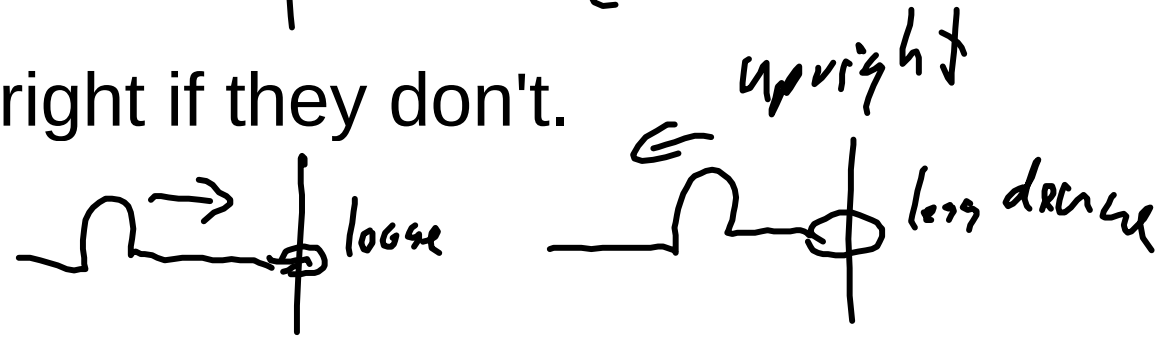
standing waves have nodes and anti-nodes.



reflected waves that create standing waves are inverted if they reflect off a denser medium.



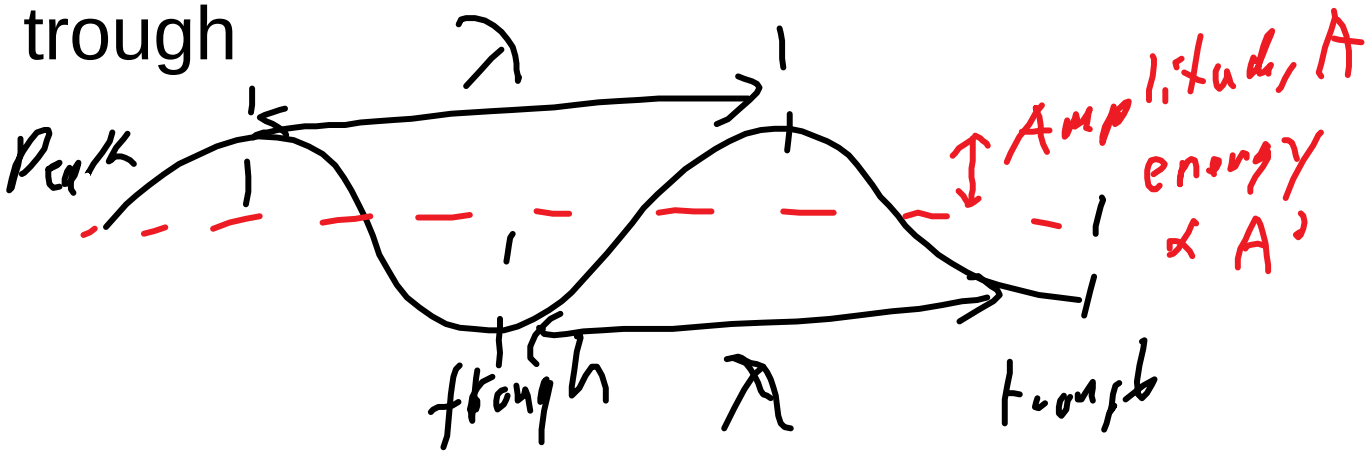
upright if they don't.



p293q1-4, p294 CR 1.1-1.4, p296 problems 5-8
define: reflection, refraction, diffraction

wave applet
http://phet.colorado.edu/sims/wave-on-a-string/wave-on-a-string_en.html

wavelength, λ, is the distance between successive points on a wave - like peak to peak or trough to trough

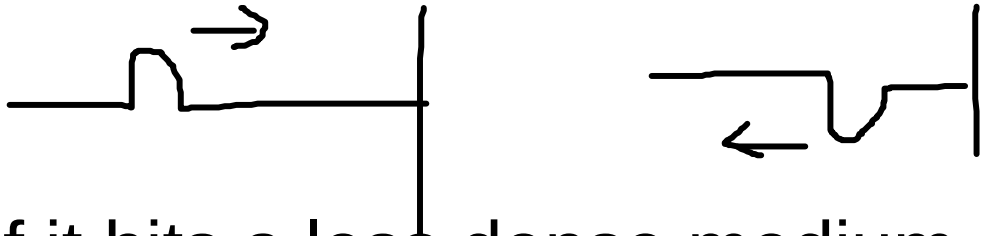


frequency, f, is the number of events per unit time.
units: Hz = event/s
period, T, is the time between

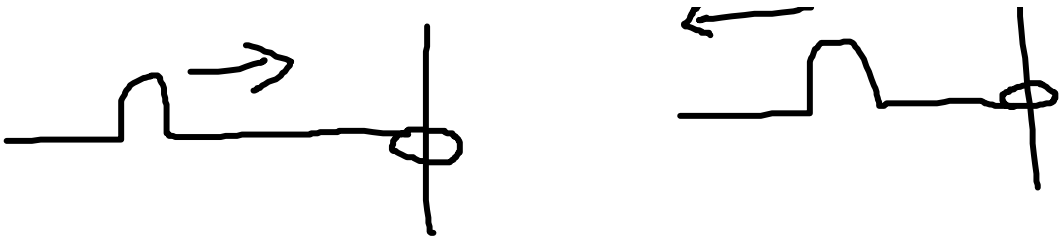
successive events in seconds, s.
f=1/T or T=1/f
wavespeed, v, is the how fast the energy is transferred through the medium to another point.
$v=\lambda f$ or $v=d/t$ where d is the distance travelled by the wave in time t.
the wavespeed depends on the medium - tension of the spring for example in the lab. Sound travels faster in water than in air.

reflection - what happens when a wave hits a boundary?

If it hits a denser medium, it reflects inverted.

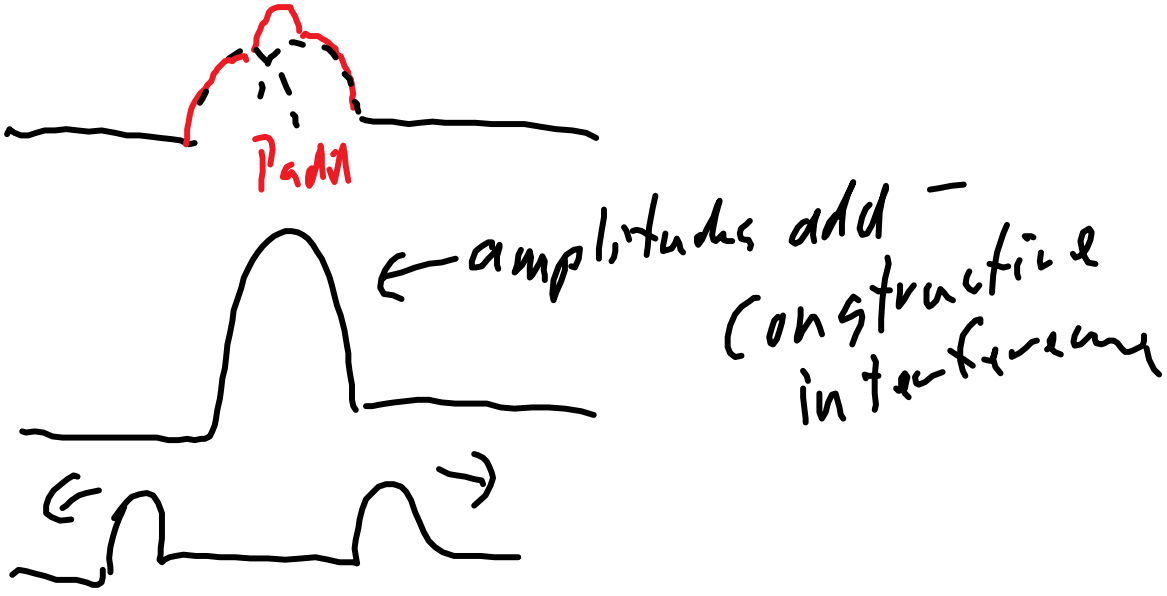


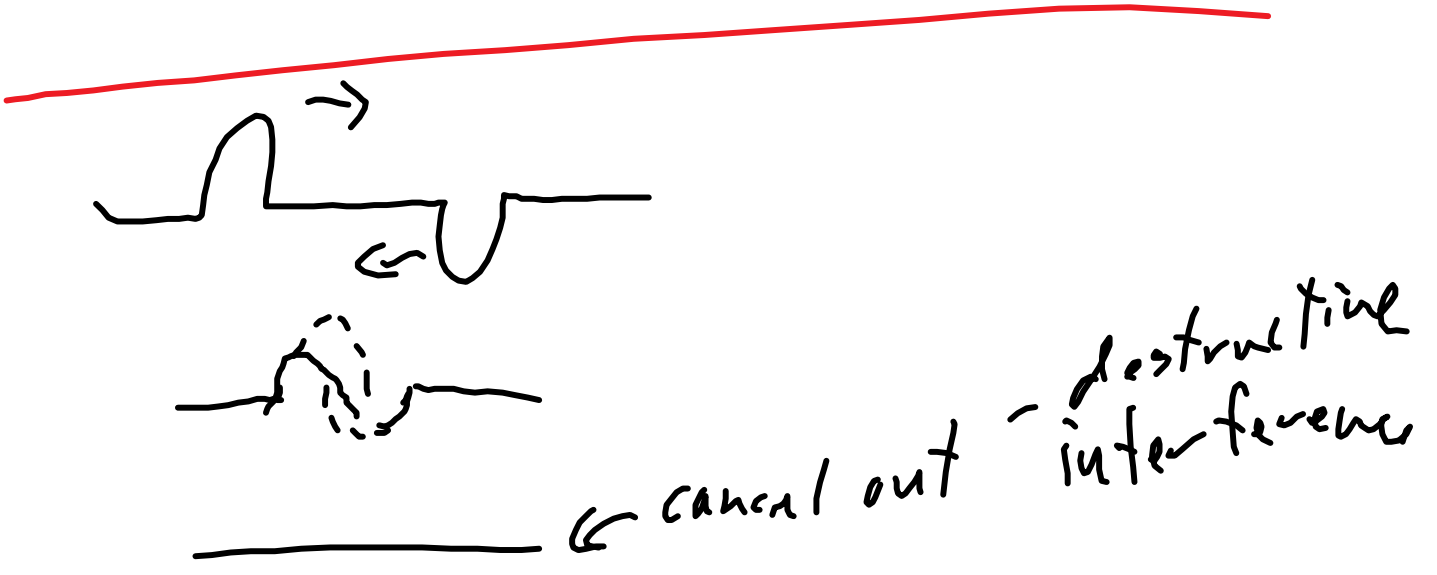
If it hits a less dense medium, it reflects upright.

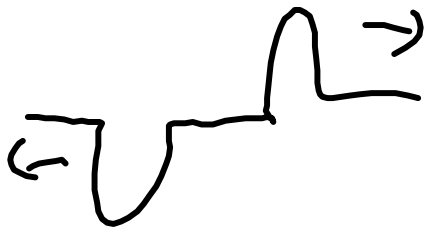


What happens when two waves meet?

Interference

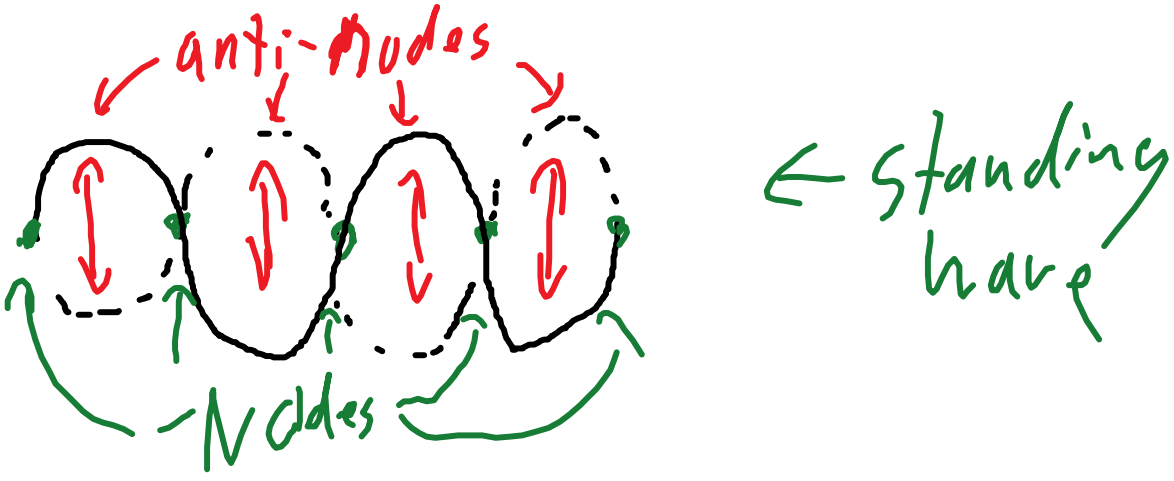






standing waves - if the frequency is just right, incoming waves interfere with reflected waves to produce high amplitude standing waves - don't seem to move. http://www.walter-fendt.de/html5/phen/standingwavereflection_en.htm

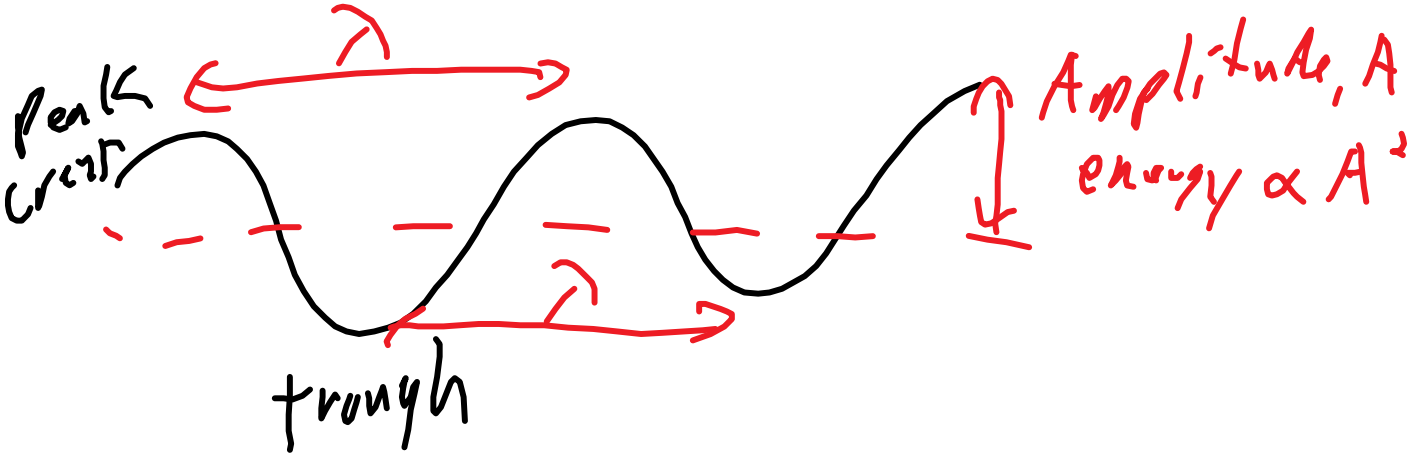
resonant frequency is the "just right" frequency to produce the high amplitude waves.



p293 Q1-4, p294 CR1.1-1.4 (last 15 minutes) p296 Q5-8

wave applet
http://phet.colorado.edu/sims/wave-on-a-string/wave-on-a-string_en.html

wavelength, λ, is distance between successive crests or troughs.



tension in the spring changed the wavespeed. Generally wavespeed is determined by the medium - not

amplitude, wavelength or frequency.

frequency, f is the number of events per unit time, or the waves produced per second. units: Hz = event/second

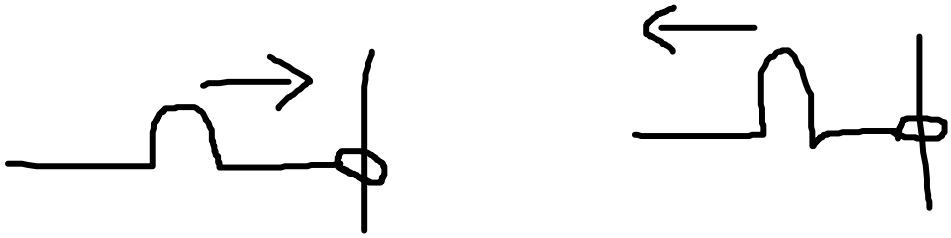
Period, T, is the time between successive waves.
f=1/T or T=1/f

v=d/t or v=λ/T = λf
d is the distance the wave moves in time t.
speed of sound is 340 m/s in air.
if you produce a 680Hz sound, what is the wavelength?
v= λf
λ= v/f = 340/680=0.50 m

speed of light in a vacuum is 3.0×10^8m/s

What happens when a wave hits a boundary? It reflects back.

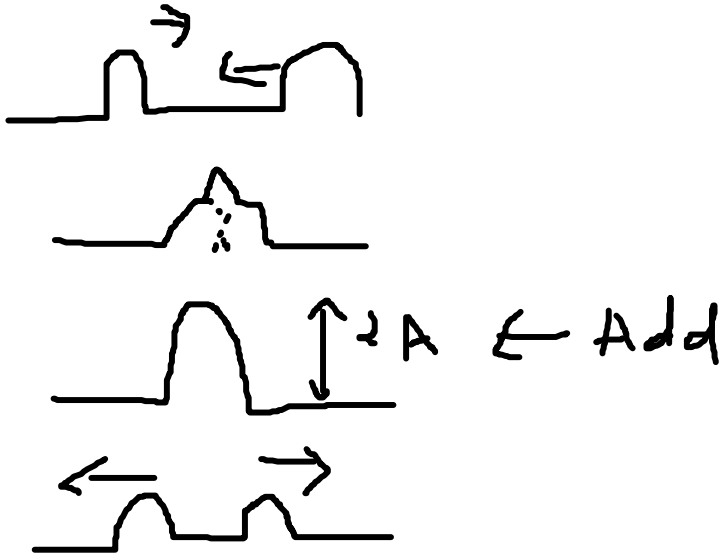
if it hits a denser medium, it bounces back inverted.



if it hits a less dense medium, it reflects upright

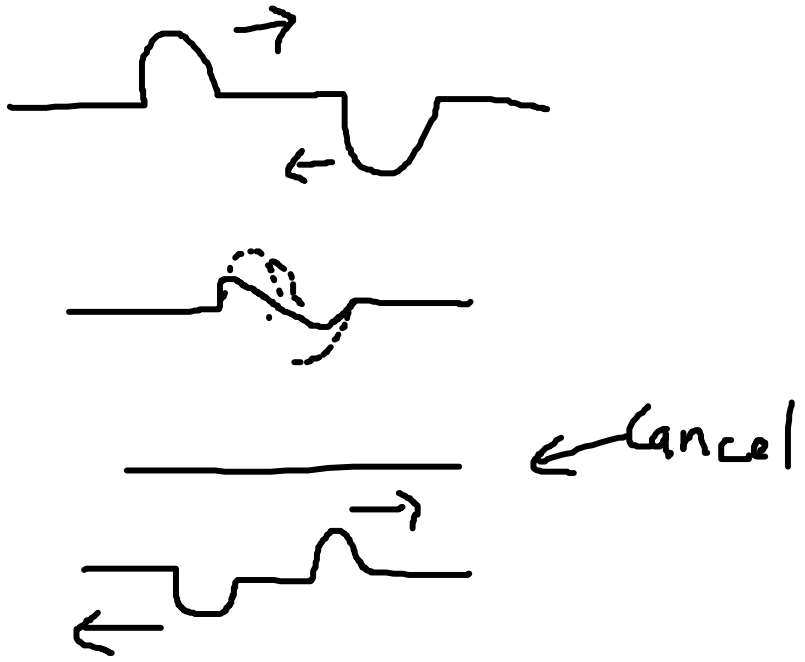
What if it hits another wave pulse?
Interference

- constructive interference waves are in phase and add together.



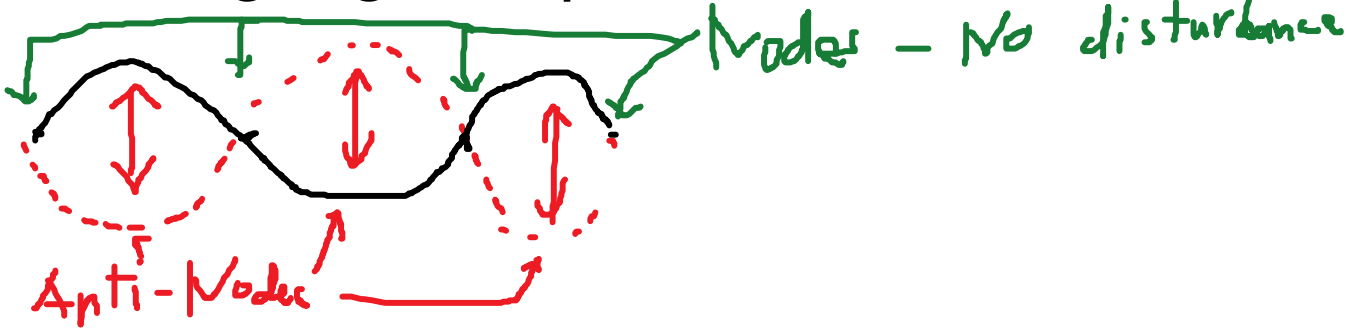
Destructive interference - the

waves are out of phase and cancel out.



http://www.walter-fendt.de/html5/phen/standingwavereflection_en.htm

when the frequency is just right, incoming waves interfere with reflected and produce high amplitude standing waves.
Resonance - "just right" frequency producing high amplitude waves.



standing waves
Node - no disturbance in the medium - spring doesn't move

p293-296 Problems 1-8
CR1.1-1.4 - 20 minutes: students give answers